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## TITLE OF THE INVENTION

INFORMATION RECORDING AND PLAYBACK APPARATUS

### CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application is based upon and claims the benefit of priority from the prior Japanese Patent Application No. 2002-347508, filed November 29, 2002, the entire contents of which are incorporated herein by reference.

### BACKGROUND OF THE INVENTION

#### 10 1. Field of the Invention

This invention relates to an information recording and playback apparatus which can record and play back information. In particular, it relates to an information recording and playback apparatus, wherein  
15 start and end of information recording can be set from outside.

#### 2. Description of the Related Art

In information recording and playback apparatuses which play back or record an information medium storing  
20 video data, such as image information, and control information, the following are set with the apparatus main body or an accompanying remote control device: recording start date and time/recording end date and time; recording source; and recording rate and  
25 recording system (sound recording system/presence and absence of simulcast), etc (hereinafter simply referred to as "recording programming"). Thereby, a desired

(preselected) recording source is recorded on the preselected date and time, with the predetermined recording rate and recording system.

Nowadays, information recording and playback  
5 apparatuses are in practical use, which can reduce an amount of the information to be inputted with the apparatus main body or a remote control device. In such apparatuses, a recording programming code called "G code" is inputted instead of predetermined  
10 data determined by broadcasters, such as recording (broadcasting) start date and time/recording (broadcasting) end date and time and recording source, in the data used for recording programming.

Further, Jpn. Pat. Appln. KOKAI Pub. No. 8-306097  
15 discloses a remote control device, which has an extension setting section and can extend the recording end time by 15 minutes for each operation of the extension setting section, in such a case where the broadcasting time of the program being recorded has  
20 been extended and its end time has been changed, or it has been found before start of recording that wrong recording end time was inputted.

However, these techniques have a problem that the user cannot change the input recording programming  
25 information or add a new recording programming, if the user cannot return from a position distant from the information recording and playback apparatus, or if

the user is out, after recording programming.

#### BRIEF SUMMARY OF THE INVENTION

According to an aspect of the present invention,  
there is provided an information recording and playback  
5 apparatus which records or plays back information,  
comprising: receive means for receiving a recording  
programming mail from the outside, the recording  
programming mail containing programming contents; and  
entering means for entering a recording programming in  
10 accordance with the programming contents obtained by  
the receive means.

According to another aspect of the present  
invention, there is provided an information recording  
and playback apparatus comprising: an information  
15 recording and playback section which records  
information in a recording medium, and plays back  
information prerecorded in a recording medium; a timer  
section which operates the information recording and  
playback section at a predetermined operation starting  
20 time, and stops the information recording and playback  
section at a predetermined operation ending time;  
a memory section which holds operation information of  
the timer section; a communications control section  
which inputs and sets at least the operation starting  
25 time and the operation ending time in the timer section  
from the outside; and entering means for entering, in  
the memory section, a recording programming including

at least the operation starting time and the operation ending time obtained through the communications control section.

According to still another aspect of the present invention, there is provided a method of controlling an information recording and playback apparatus, the method comprising: receiving a mail from outside; judging whether the received mail contains recording control information including at least an operation starting time and an operation ending time; judging whether a recording programming is acceptable with the operating starting time and the operating ending time included in the mail judged to be a mail containing the recording control information; and storing, in a memory section, the operation starting time and the operation ending time included in the recording control information contained in the mail whose recording programming has been judged acceptable, the operation starting time and the operation ending time serving as information used for controlling a timer section, the timer section operating and stopping an information recording and playback section at the operation starting time and the operation ending time, respectively.

#### BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

The accompanying drawings, which are incorporated in and constitute a part of the specification,

illustrate embodiments of the invention, and together with the general description given above and the detailed description of the embodiments given below, serve to explain the principles of the invention.

5           FIG. 1 is a schematic diagram showing an example of a recording and playback apparatus to which an embodiment of the present invention is applicable;

          FIG. 2 is a schematic diagram showing an example of arrival of mails on the recording and playback  
10           apparatus shown in FIG. 1, and transmission and reception of mails between a mail server and a portable terminal;

          FIG. 3 is a flow chart showing an example of recording programming by an E-mail; and

15           FIG. 4 is a flow chart showing a procedure of entering a recording programming from an E-mail.

#### DETAILED DESCRIPTION OF THE INVENTION

An embodiment of the present invention will now be described in detail with reference to drawings.

20           A recording and playback apparatus 1 shown in FIG. 1 includes an information recording and playback section 111 which can record input information in a predetermined recording medium and play back  
          information stored already in a recording medium in  
25           response to a playback operation, and a microcomputer (MPU, that is, a main control unit) 101 which controls recording in, and playback from, the information

recording and playback section 11, and operations of sections explained below.

The information recording and playback section 111 comprises a disk drive unit 113 which can record  
5 information in, and play back information from, a disk D manufactured in compliant with the DVD (Digital Versatile Disk) standard, and a temporary recording section 115 functioning as a buffer memory, which can temporarily hold a certain amount of data to be  
10 recorded in, or data reproduced from, a disk D set in the disk drive unit 113.

In the case where, for example, all the available memory of the disk D has been filled during recording, the temporary recording section 115 temporarily holds  
15 information to be recorded, until the disk D has been changed to a disk having an available memory area. In addition to the disk drive unit 113, a hard disk drive HDD may be provided, which is suitable for recording and retrieval (playback) of massive information.

20 The information recording and playback section 111 is connected with an encoder 121 which encodes input information into a form recordable by the information recording and playback section 111, and a decoder 131 which decodes information outputted from the  
25 information recording and playback section 111 into a form displayable by an output device described below.

The encoder 121 is connected with an AV (Audio

Video) input section 123 to which recording  
information, being image information or the like, can  
be inputted from the outside, and a tuner section 125  
which receives images and sounds distributed from  
5 information distributors, such as broadcasters.

The decoder 131 is connected with an AV (Audio  
Video) output section 133 which supplies playback  
information decoded (by the decoder 131) to an output  
device, typified by a playback equipment (television)  
10 and a monitor.

The MPU 101 is also connected with a timer  
microcomputer section 141. The timer microcomputer  
section 141 receives an input signal from the recording  
and playback apparatus 1, or from an accompanying  
15 remote control terminal (remote control device) R. The  
input signal includes recording programming information  
such as recording (broadcasting) start date and  
time/recording (broadcasting) end date and time;  
recording source; and recording rate and recording  
20 system (sound recording system), etc (hereinafter  
simply referred to as "recording programming").

Further, the timer microcomputer section 141 is  
connected with a remote control input section 142 which  
receives a control signal from the remote control  
25 device R, a timer circuit (clock unit) 143 which  
manages and playback apparatus 1, and a user operation  
input section 145 which receives an operation request

(instructions) from the user.

The MPU 101 is also connected with a display section 151 which displays information inputted to the timer microcomputer section 141 or an operation state of the apparatus 1, a communications control section 103 which receives a recording programming from the outside and informs a designated destination whether the recording programming is acceptable or not, through a network NT, and a memory 105 which stores recording programming information and the like. Further, the communications control section 103 is provided with a memory (not shown) containing browser software (application software for enabling finding and browsing of information in a network) widely used in the network NT, a microcomputer (control unit, not shown), and a dialer which secures communications for transmitting mails to the outside under predetermined conditions.

The MPU 101 controls, recording, copying and deleting with respect to the disk D, and controls changes of operation of the recording and playback apparatus inputted to the timer microcomputer section 141 through the user operation input section 145, and display to the user with the display section 151, in accordance with a control program stored in the memory 105.

The timer microcomputer section 141 manages the recording programming information set by the user,



while monitoring the timer circuit (clock unit) 143,  
and instructs the MPU 101 to start recording when the  
programmed recording starting time has come, and  
instruct the MPU 101 to end the recording when the  
5 programmed recording ending time has come.

The user operation input section 145 receives an  
operation request from the user, such as change of the  
operation of the recording and playback apparatus and  
reception of the recording programming information.  
10 The user operation input section 145 comprises a data  
receiving section which receives a control signal from  
the remote control device (remote control terminal) R,  
and a control signal input section (not shown) which  
outputs a control signal to the timer microcomputer  
15 section 141 in response to an instruction directly  
inputted by the user with an operation panel (not  
shown) of the main body of the apparatus 1.

FIG. 2 is a schematic diagram showing an example  
of recording programming from outside on the recording  
and playback apparatus shown in FIG. 1.  
20

As shown in FIG. 1, an existing communication  
apparatus (portable terminal) 201, represented by  
personal computers PC and cellular phones CP, transmits  
an E-mail (hereinafter simply referred to as "mail") M  
25 containing recording programming information from the  
user to a mail server (commercial communications  
control unit for network) 299. The recording and

5 playback apparatus 1 distinguishes whether the body of the mail received from the mail server 299 contains a specific character string. If the mail contains the specific character string, the recording and playback apparatus 1 judges the character string to be programming information, and set a recording programming in the recording and the playback apparatus 1 itself.

10 FIG. 3 is a flow chart showing an example of reception of recording programming by a mail and a procedure of entering a recording programming.

15 First, the communications control section 103 of the information recording and playback apparatus 1 checks whether a predetermined mailbox of the predesignated mail server has a newly-received mail M or not (S1).

20 When it is checked that at least one mail M has been received (S1-Yes), the number "the number of mails = n" is set in the memory 105 as the total number of the received mails (S2).

Next, a capture (reception) request for receiving the mail of "n" number is transmitted (S3), and the mail of "n" number is received from the mailbox (S4).

25 Then, it is judged whether the received mail is a recording programming mail or not (S5). If the mail is a recording programming mail (S5-Yes), it is judged whether recording programming is impossible or not,

for example, the apparatus has already been programmed to record its maximum recordable programs (S6). If a new recording programming is unacceptable (S6-Yes), the apparatus sends a reply mail to notify that the programming by mail was not accepted (S7).

In step S6, if a recording programming is acceptable (S6-No), the recording programming is additionally entered in a recording programming information table in the memory 105, in accordance with the contents of the mail (S8).

Thereafter, the apparatus issue an instruction to the mailbox to delete the mail of "n" number, and sends a mail which notifies the user that "end (completion of acceptance) of recording programming for the mail of n number" (S9). Simultaneously, or at a predetermined timing, the number of mails in the memory 105 is rewritten to "n = n-1" (S10).

Then, it is judged whether the number "n-1" in the memory 105 is greater than 0 or not (S11) and, in the case of  $n-1 > 0$  (S11-Yes), the steps S3 to S9 are repeated. Thereby, capture of the rest of the mails, judgment as to whether each of the mails is a recording programming mail, and recording programming if it is a recording programming mail are repeated until the number "n-1" is judged to be "0".

FIG. 4 is a flow chart showing an example of distinction about whether a received mail is

a recording programming mail or not.

If a received mail includes a line of character string starting with a character string "open", the apparatus judges the mail to be a recording programming mail (S101).

For example, if a mail M having a description "open, pass (name), 19991231, 2200, 2359, 8, S, A" has been received, it is regarded that the string "open" indicates that the mail is a recording programming mail, the string "pass" indicates a password or a preregistered user name, the string "19991231" indicates a recording date, being December 31, 1999, the string "2200, 2359" indicates that a recording start time is 22:00 and a recording end time is 23:59, the string "8, S, A" indicates a channel number 8 as a recording source, and an image quality SP (standard recording mode) and a sound quality DD1 (Dolby Digital 1) as a recording rate.

Since information defined by a 8-digit number may be a recording programming code called "G-code", it is judged whether the number string following the string "pass (name)" is a recording programming code or not (S102).

If the number string is a recording programming code, first four digits thereof indicate a number which does not correspond to a year of the Christian Era, and thereby the string is judged a recording programming

code (S102-Yes). If it is a recording programming code, the recording start date and time, the recording end date and time, and channel number (the user does not need to select the recording source, in the case of using a recording programming code) is obtained therefrom. Therefore, the recording rate is then read (S103), and they are additionally entered in the recording programming information table in the memory 105 (S104).

If the number string is not a recording programming code (S102-No), the recording start date and time, the recording end date and time, recording source and recording rate, which are necessary for a recording programming, are read from the mail M, and additionally entered in the recording programming information table of the memory 105 (S104).

As described above, according to the present invention, it is possible to perform a recording programming at any time by an E-mail, even under conditions where recording programming by using the apparatus main body or the remote control device is difficult.

Therefore, it is possible to set start and end of recording information under conditions where recording programming by using the apparatus main body or the remote control device is difficult, and prevent failing in recording information due to the user's being out

without programming recording, etc.

Additional advantages and modifications will readily occur to those skilled in the art. Therefore, the invention in its broader aspects is not limited to  
5 the specific details and representative embodiments shown and described herein. Accordingly, various modifications may be made without departing from the spirit or scope of the general inventive concept as defined by the appended claims and their equivalents.